United States Patent [19]

Pierre et al.

[11] **3,785,666**

[45] **Jan. 15, 1974**

[54] **DEVICE FOR CHANGING THE LONGITUDINAL POSITION OF A SKI BINDING**

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[52] **U.S. Cl.** ..... **280/11.35 T**

[51] **Int. Cl.** **A63c 9/00**

[58] **Field of Search** ..... 280/11.35 T

[56] **References Cited**

FOREIGN PATENTS OR APPLICATIONS

469,492 4/1969 Switzerland ..... 280/11.35 T

1,307,982 9/1961 France ..... 280/11.35 T

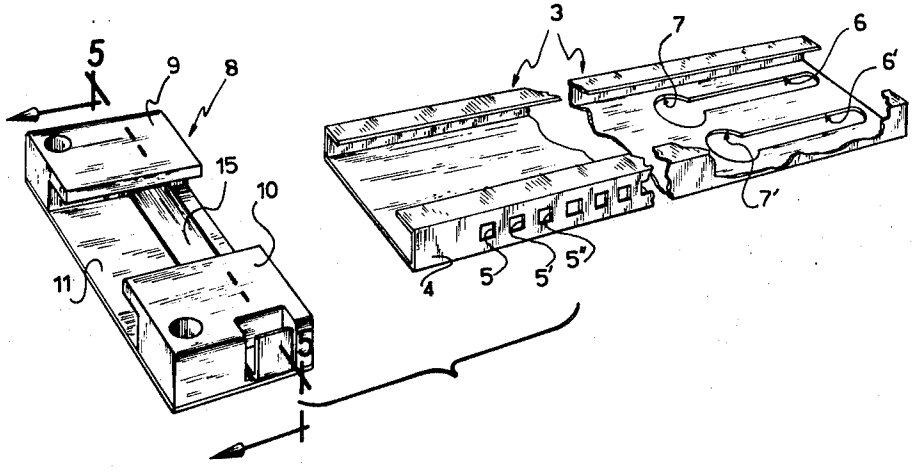
Primary Examiner—Robert R. Song

Attorney—Rober Goudreau

[57] **ABSTRACT**

A device making it possible to change the longitudinal position of a binding on a ski rapidly; the device includes a clamp and slide arrangement permitting longitudinal displacement and two profiles engaging with each other under the action of a spring exerting a thrust transversely relative to the ski.

8 Claims, 5 Drawing Figures



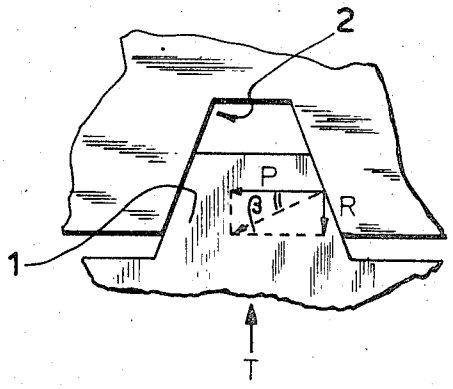


FIG.1

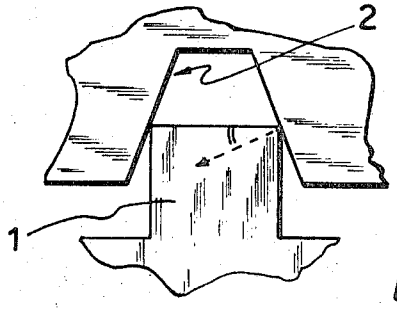


FIG.2

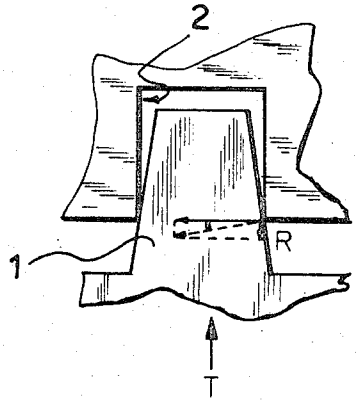


FIG.3

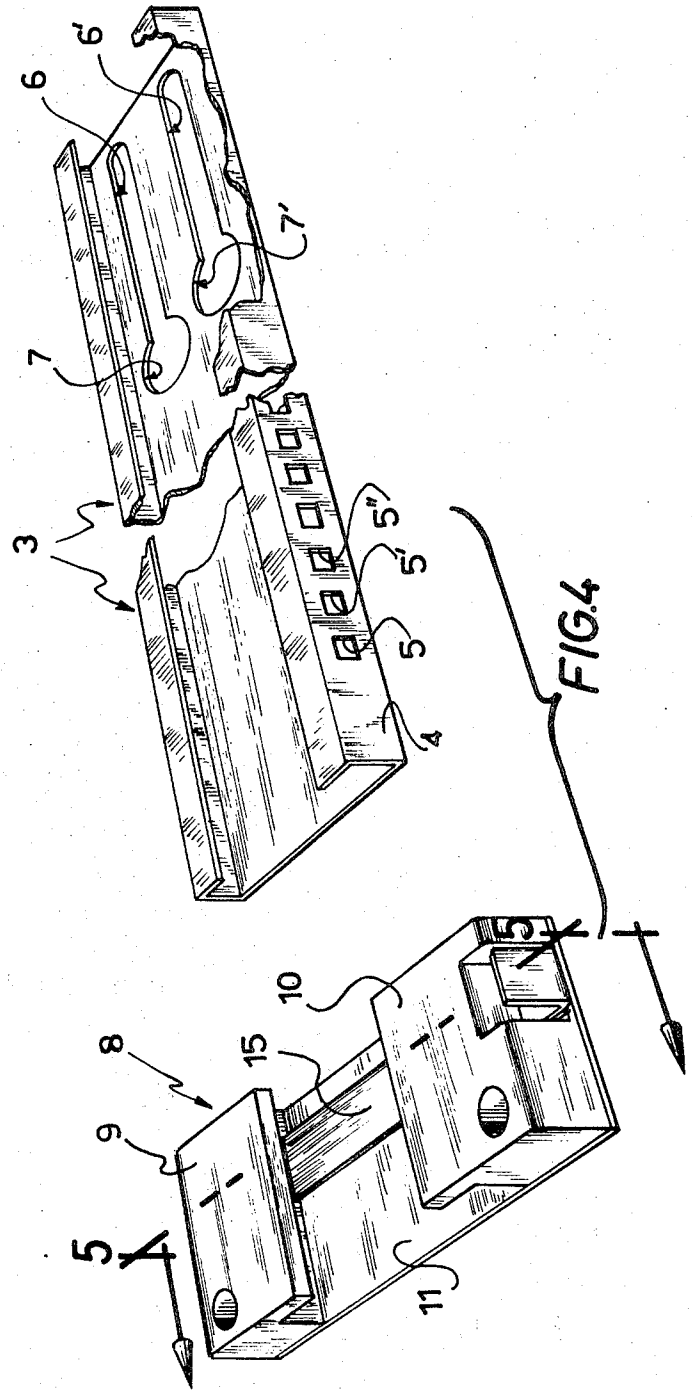


FIG.4

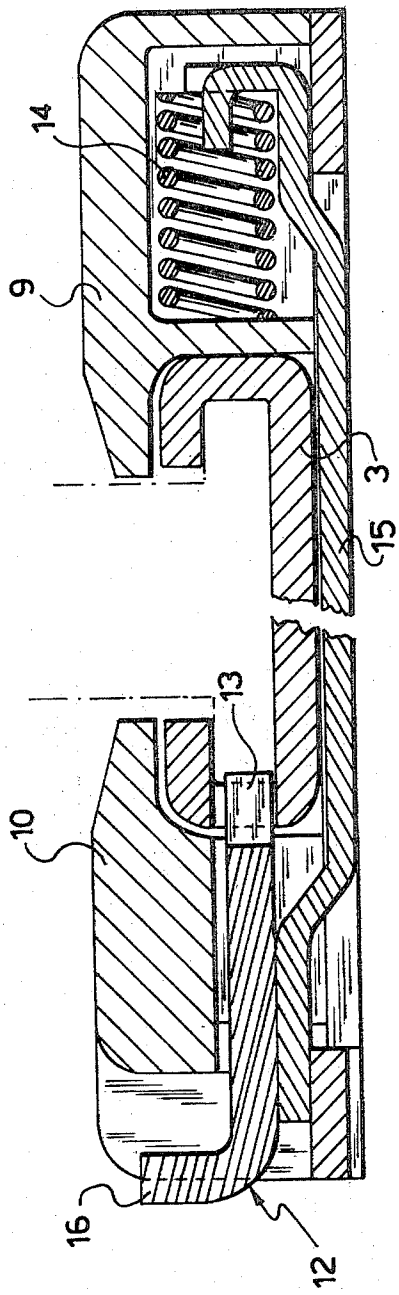


FIG.5

DEVICE FOR CHANGING THE LONGITUDINAL POSITION OF A SKI BINDING

Many devices are known which make it possible to adapt the distance between the stop and the heel-piece to the length of the sole of the boot, these devices being particularly indispensable for bindings used for renting, which must be designed to accomodate boots of different manufacture and sizes.

As a rule, such devices comprise at least one set of teeth on the binding to be adjusted and a corresponding set of mobile teeth, integral with the ski, which mesh with some of the teeth on the binding. An arrangement of this kind is described in French Pat. No. 1,307,982, filed on Sept. 16th, 1961, in the name of G.P.J. SALOMON. In this patent, the part integral with the ski and carrying the set of teeth also holds the binding to the ski, but must be unscrewed to allow a change in length adjustment.

In other devices, the teeth integral with the ski engage with teeth on the binding under the action of a spring, and more rapid length adjustment is possible by compressing the spring and releasing the teeth. In this case, however, these devices are separate from those which hold the binding to the ski and are therefore supplementary parts which take up more room and are detrimental to the appearance of the unit. This is all the more true in that the teeth are generally cut out of the base-plate of the binding whereby the rack extends longitudinally of the ski; it is then necessary to mount the other set of teeth on a part moving in a plane perpendicular to the plate in order to prevent the length adjustment changing uncontrollably when the foot pushes against the binding, for instance when the ski bends. Finally, these devices are not very convenient to operate either because, in order to raise the teeth, pressure must be applied to a moving part during the adjustment, or because the moving teeth are difficult of access, or because a special tool, such as a screwdriver, must be used to carry out the adjustment.

It has, however, been suggested to make the moving teeth displaceable in the plane of the ski, thus in that of the base plate, especially in one Swiss Pat. No. 469,492, filed on Dec. 4th, 1967, in the name of REUGE and in German Specification No. 1,954,513, filed on Oct. 29th, 1969, in the name of PFRETSCHNER. However, in these two patents the set of moving teeth is locked after adjustment by means of screws or bolts in order to prevent inadvertent adjustment.

It is an object of this invention to overcome the foregoing disadvantages.

According to the present invention, the set of teeth carried by the binding consists of a succession of hollow profiles forming a sort of rack running substantially longitudinally of the ski, the set of teeth co-operating with a second set of teeth adapted to move transversely of the ski against the action of a spring which engages the second set of teeth with the teeth on the binding, the profiles of the two sets of teeth being such that, once they are engaged, the frictional forces between them, plus the transverse load of the spring, is greater than or equal to the maximal opposing force capable of being exerted transversely on the set of moving teeth when a longitudinal thrust is applied to the binding.

The invention therefore proposes a system of irreversible mechanical adjustment.

The invention may be reduced to practice by using either a weak spring with teeth such that angle β of the component of thrust on the moving teeth is of the order of about ten degrees at the most relative to the longitudinal axis of the ski, or else a strong spring with teeth such that angle β does not exceed a few tens of degrees. It is preferable that β shall at all times be greater than 0, since this arrangement makes it possible to take up a certain amount of play automatically. The male profile may be located on the binding or, preferably, on the moving teeth.

According to one preferred embodiment of the invention, the teeth consist of circular or polygonal perforations in the vertical, folded sides of the slide or the baseplate of the binding.

The invention will be better understood with the aid of the following description of a few embodiments given by way of example and illustrated in the drawing, wherein:

FIGS. **1, 2** and **3** illustrate schematically the principle of the three ways of reducing the invention to practice;

FIG. **4** is an overall view of one form of execution, shown in perspective and partly cut away;

FIG. **5** shows a section of FIG. **4** along the line V—V.

FIGS. **1, 2** and **3** illustrate the principle used by the invention, without indicating whether the teeth are crenellated, circular or polygonal perforations since these characteristics are merely design details. The tooth on the set of moving teeth is shown as the male part, but this should not be considered mandatory.

In FIG. **1,** moving tooth **1** is pushed by the transverse force T of a spring (not shown) and therefore engages with the corresponding profile **2** on the binding (not shown) which may undergo a maximal thrust P. Force R resulting from this thrust opposes the action of T which is increased by the force "*f*" of friction between tooth **1** and profile **2.** In order that the system be irreversible, all that is required is that:

$$R \leq T + f.$$

In the case in this figure, R is relatively great since β is slightly in excess of 10°, and a strong spring will be required to supply T.

FIG. **2** shows a variant in the shape of tooth **1.**

FIG. **3,** on the other hand, shows the case in which β is very small, R is therefore weak, and friction is high; the spring supplying T may be weak and, in this latter case, the length adjustment is easier to make, since only a slight pull on part **1** will release profile **2.**

FIG. **4** is a detailed example of execution of the present invention. The sliding member carrying the binding, not shown, is indicated by the general reference **3.** It has been cut for scale reasons in order to clarify the drawing. One of the folded vertical sides of this sliding member is equipped with substantially square holes **5, 5', 5''** etc. . . . , corresponding to profile **2** in FIG. **3.** This sliding member also carries on its base plate elongated apertures **6** and **6',** ending in circular orifices **7** and **7',** the function of which will be explained hereinafter.

This sliding member is fastened to the ski at one end by a clamping member **8** consisting of two flanges **9** and **10** joined together by a bridging plate **11.** Each flange carries a drilled hole for the attachment screws to the ski. The shape of the flanges prevents the sliding member from moving upwardly; this arrangement is

strengthened by means of two screws passing through apertures **6, 6'** into the ski. In order also to prevent the sliding member from moving axially on the ski, this movement being permitted by the aforesaid apertures, the invention provides a part **12** comprising teeth **13,** as shown in FIG. **5.** These teeth engage in holes **5, 5', 5''** under the action of a return spring **14** accommodated in flange **9,** and due to the fact that part **12** is joined, for example by welding, to a part **15** which slides in the thickness of plate **11** and is subjected to the action of the said spring. Experience has shown that three teeth are enough to lock the sliding member.

The sliding member is thus locked in all directions, but all that is required to carry out a length adjustment is to exert a pull on tongue **16** against the action of spring **14.** The teeth will then emerge from holes **5, 5', 5''** (FIG. **4**) and the sliding member is free to slide freely between flanges **9, 10,** until the pull on tongue **16** is released. This pull may be effected quite simply with the aid of a small wrench acting as a screwdriver which is usually attached to the safety thong.

Tongue **16** is accommodated in a housing in the flange to prevent inadvertent operation.

Another part such as **8,** but without the length adjusting device, could be used in place of the apertures **6, 6'.**

It is to be understood that perforations could be provided on both sides of the sliding member, and teeth in the two flanges. The teeth could also be located on the same side as the spring. In short any detail modification could be carried out without departing from this present invention.

Similarly, the locking system is accommodated in the flanges merely for convenience, since it could obviously also be located on the sliding member or on the base-plate of the binding.

Finally, the action of tongue **16** could be either a pull or a push.

What is claimed is:

1. A device for changing the longitudinal position of a binding on a ski, comprising: a sliding member including means for securing said member to the binding; a clamping member including a pair of opposite spaced flanges and means for securing said clamping member to the ski; said sliding member being movable longitudinally in said clamping member; said sliding member defining a first profile and said clamping member defining a second profile; said first and second profiles each having contact faces and adapted to cooperate with one another, said profiles extending transversely to the longitudinal movement of said sliding member said second profile being transversely movable relative to said first profile; and a spring associated with said second profile and mounted in said clamping member for forcing said second profile into frictional engagement with said first profile; the face of at least one of said profiles making, with the longitudinal axis of the ski, an angle having a value other than 90° and, with the direction of the longitudinal force exerted by the binding to the profiles, an angle having a value less than 90°, whereby said force always includes a component transverse to the longitudinal axis and opposing the force of said spring; said component being always at least equal to or less than the value of the force of said spring plus the frictional forces between said first and said second profiles.

2. A device as defined in claim **1** wherein said sliding member includes opposite side walls having therein a series of openings with axes parallel to the plane of the ski; said second profile consisting of teeth disposed parallel to the plane of said ski and pushed by said spring into said openings to lock the binding in a selected adjustment position.

3. A device as defined in claim **2,** wherein said teeth have, in a plane parallel to that of the ski, a trapezoidal shape with lateral sides converging in the direction of said openings.

4. A device as defined in claim **1,** wherein said second profile is slidably mounted in a plane parallel to that of the ski and is located in one of said flanges of said clamping member.

5. A device as defined in claim **4,** wherein said second profile is associated with a spring urging said second profile in a space included between said two opposite flanges of said clamping member.

6. A device as defined in claim **5,** wherein said spring is located in one of said flanges of said clamping member.

7. A device as defined in claim **6,** wherein said spring is located in the flange opposite to that in which slides the second profile, said spring acting on a portion of said second profile transversely extending to the ski; said portion being fixed, at one end to said second profile and, being mounted, at the other end, for free sliding movement in said opposite flange.

8. A device as defined in claim **4,** wherein said second profile is integral with a tongue laterally operable toward the outside against the action of said spring in order to enter said second profile in its associated flange.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,785,666 Dated January 15, 1974

Inventor(s) GEORGES, PIERRE, JOSEPH SALOMON

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

On the cover sheet [76] Inventors: "Georges, Pierre; Joseph Salomon, both of 34, avenue de Loverchy, Annecy, France" should read -- Georges, Pierre, Joseph Salomon, 34, avenue de Loverchy, Annecy, France -- .

Signed and sealed this 6th day of August 1974.

(SEAL)
Attest:

McCOY M. GIBSON, JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents

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